

Work Order ID 164493***164493***

Page 1

Wednesday, July 19, 2017 2:43:35 AM

Item ID: D5155-3

Accept

N900040100

Setup Start

NS1

Revision ID:

Stop

NS2

Item Name: Co-Pilot Collective Head (212)

Start Date: 7/19/2017 Start Qty: 4.00

4

Cust Item ID:

Required Date: 8/4/2017 Req'd Qty: 4.00

4

Customer:

Reference:

Approvals: Process Plan: DAS 21 Date: JUL 20 2017

Tooling:

Date:

Run Start

NR1QC: 9-89

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
D5155	B

100

Cut blanks as per folio

0.00

100

Bandsaw

Memo

0.16

Jeaspa Bandsaw

CUT BLANK AT 5.000"

4 0 3.6
17/08/16

110

2.49

110

HAAS 5AXIS

Memo

3.35

HAAS CNC vertical machine #5

MACHINE AS PER DWG & FOLIO FB349/ D5155-3

FOLIO REV: AADWG REV: B

DA 17-08-26

4 0 DAS
08
9-89

DO NOT BUFF OR POLISH PART

DEBURR

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval 		
Description Work Order Deviation				Disposition					
								Completed By	
								Lead hand / Supervisor Approval Verification	
								QC / QA Coordinator Approval	

Root Cause			FAULT CATEGORY							
Environment	☐	No Re-verification	☐	Pressure/Forced	☐	Temperature/Cure	☐	Power Loss/Surge	☐	Positioned Wrong
Design	☐	Operator	☐	Bending	☐	Set-up	☐	Folio/Program	☐	Outside Dimensions
Doc/Data	☐	Offset/Setup	☐	Centre Not Concentric	☐	BOM/Route	☐	Grain	☐	Over/Under tolerance
Equip/Tooling	☐	Supplier	☐	Cracks	☐	Broken/Damage/Defect	☐	Weld	☐	Part Incorrect
Handling/Pre	☐	Training	☐	Crimp/Kink/Ripple/Wave	☐	Inspection Incomplete/Unqualified	☐	Wrong Stock Pulled	☐	Part Lost/Missing
Material	☐	Use for Testing	☐	Cuffs	☐	Contamination	☐	Out of Sequence	☐	Part Moved
Internal Transport	☐	Poor Information	☐	Crushing	☐	Countersink	☐	Off-set	☐	Drawing
Tribal Knowledge	☐	Rushing	☐	Heat Treat	☐	Cut Too Short	☐	Mislabeled	☐	Finish
LOA	☐	Product Improvement	☐	Wave/Twist in Tube	☐	Instructions Incomplete/Unclear	☐	Fit/Function	☐	Misread
Substation	☐	Process Improvement	☐	Marks/Chatter	☐	Drill Holes	☐	Misaligned/off center	☐	Turning Sequence
Past Expiry Date	☐	Manufacturing Process	☐	OTHER :						
Misidentified	☐	Past Due	☐							

Work Order ID 164493

Wednesday, July 19, 2017 2:43:35 AM

164493

Page 2

Item ID: D5155-3 Accept ***N900040100*** Setup Start ***NS1***
Revision ID: Stop ***NS2***
Item Name: Co-Pilot Collective Head (212)
Start Date: 7/19/2017 Start Qty: 4.00 ***4*** Cust Item ID:
Required Date: 8/4/2017 Req'd Qty: 4.00 ***4*** Customer:
Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120 *120* QC Quality Control	QC1- Inspection performed by CMM <i>QC2</i> Memo Inspect on CMM as per folio CMMA032. DWG REV: _____ CMM PROG. REV: _____	0.00 0.08		<i>D.P. 17-08-26</i>		<u>4</u>	<u>0</u>		DAS 08 9-30
130 *130* QC Quality Control	QC8- Inspect parts - second check Memo	0.00 0.08				<u>4</u>	<u>0</u>		DAS 44 9-30 17-08-28
160 *160* Packaging Packaging	Identify as per dwg & Stock Location: <i>51374</i> Memo	0.00 0.04				<u>4</u>	<u>0</u>		DAS 66 9-30 AUG 29 2017

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐																																																													
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Misidentified ☐	Past Due ☐																																																																

Work Order ID 164493

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Page 3

Item ID: D5155-3 Accept ***N900040100*** Setup Start ***NS1***
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Required Date: 8/4/2017 Req'd Qty: 4.00 ***4*** Customer:
Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
170	QC21- Final Inspection - Work Order Release	0.00							
170									
QC	Memo	0.40							
Quality Control									

DAS
21
9-89

AUG 29 2017

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By _____ Lead hand / Supervisor Approval Verification _____ QC / QA Coordinator Approval _____		
Description Work Order Deviation				Disposition					
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐		OTHER : ☐					

Picklist Print

Wednesday, July 19, 2017 2:43:38 AM

Page 1

Work Order ID: 164493

164493

Parent Item: D5155-3

D5155-3

Parent Item Name: Co-Pilot Collective Head (212)

Start Date: 7/19/2017

Required Date: 8/4/2017

Start Qty: 4.00

Required Qty: 4.00

Comments: IPP REV.A NEW ISSUE JFS 15/01/14 VERIFIED BY: JLM IPP
REV:B 15.07.02 AS PER DWG REV.B DD VERF:JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
M6061T6B4.500X4.500		Purchased	No			100	f	2.7500	0.417	1.755789			

M6061T6B4 500X4 500

6061-T6 Aluminum Bar 4.500" X 4.500"

Location

Loc Qty

Loc Code

MAT007

2.75

m137980

2.75

138175

1.76

1.76

S.L.
17/08/16

DQA: _____ Date: _____



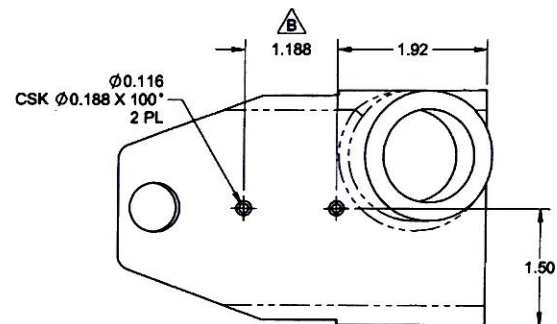
WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval 		
Description Work Order Deviation				Disposition					
							Completed By		
							Lead hand / Supervisor Approval Verification		
							QC / QA Coordinator Approval		

Root Cause				FAULT CATEGORY			
Environment ☐	☐	No Re-verification	☐	Pressure/Forced	☐	Temperature/Cure	☐
Design ☐	☐	Operator	☐	Bending	☐	Set-up	☐
Doc/Data ☐	☐	Offset/Setup	☐	Centre Not Concentric	☐	BOM/Route	☐
Equip/Tooling ☐	☐	Supplier	☐	Cracks	☐	Broken/Damage/Defect	☐
Handling/Pre ☐	☐	Training	☐	Crimp/Kink/Ripple/Wave	☐	Inspection Incomplete/Unqualified	☐
Material ☐	☐	Use for Testing	☐	Cuffs	☐	Contamination	☐
Internal Transport ☐	☐	Poor Information	☐	Crushing	☐	Countersink	☐
Tribal Knowledge ☐	☐	Rushing	☐	Heat Treat	☐	Cut Too Short	☐
LOA ☐	☐	Product Improvement	☐	Wave/Twist in Tube	☐	Instructions Incomplete/Unclear	☐
Substation ☐	☐	Process Improvement	☐	Marks/Chatter	☐	Drill Holes	☐
Past Expiry Date ☐	☐	Manufacturing Process	☐	OTHER :			
Misidentified ☐	☐	Past Due	☐				



AGENT
E
R

3.000

1.81

0.59

R0.30
2 PL

R0.25
2 PL

Ø0.150
TAP THRU FOR 6-32 HELI-COIL
2 PL

1.750

1.350

R0.25
2 PL

2.400

0.300

REU

RELEASED
A.P. 2015 JUL 02

2) FINISH: NONE
3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
4) UNITS: INCHES UNLESS OTHERWISE NOTED
5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
6) IDENTIFICATION: IDENTIFY PER QSI 044 6.3 IN THIS AREA TO MAX DEPTH
OF 0.010 WITH A MIN. TOOL RAD OF R0.010
7) WEIGHT: 0.51 lbs
8) UNDIMENSIONED FEATURES DEFINED BY D5155-3.SLDPR1

D5155-3 CO-PILOT COLLECTIVE HEAD (212)

APPROVED	DESIGN	VS	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA D5155 TITLE CO-PILOT COLLECTIVE HEAD COPYRIGHT © 2013 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE & CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSES OR CONTAINED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF DART AEROSPACE LTD.	REV. B
	DRAWN	VS		SHEET 7 OF 14
	CHECKED	RF		
	MFG. APPR.	JFS		
	APPROVED	HS		SCALE
	DE APPR.	DS		NTS
	DATE	15.05.21		

8 7 6 5 4 3 2 1

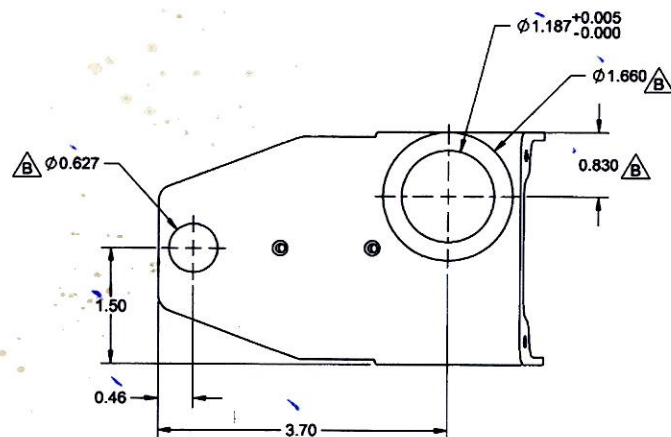
D

C

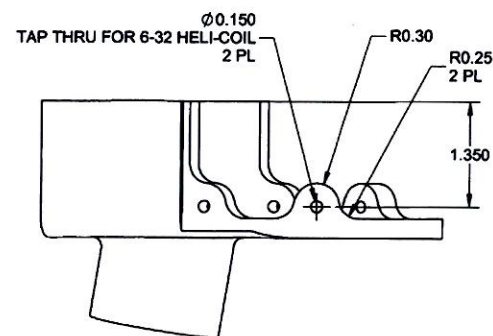
B

A

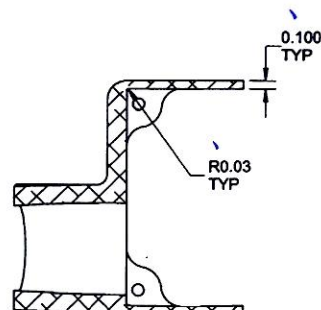
8 7 6 5 4 3 2 1



VIEW G-G
B6-7



VIEW H-H
D7-7



SECTION I-I
D8-7

- NOTES:**
 1) MATERIAL: N/A
 2) FINISH: N/A
 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 6) IDENTIFICATION: N/A
 7) WEIGHT: N/A

D5155-3 CO-PILOT COLLECTIVE HEAD (212)
DETAIL VIEWS

RELEASED
A.P. 2015 JUL 02

APPROVED

DESIGN	VS	DART AEROSPACE LTD	
DRAWN	VS	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. B
MFG. APPR.	JFS	D5155	SHEET 8 OF 14
APPROVED	HS	TITLE	SCALE
DE APPR.	DS	CO-PILOT COLLECTIVE HEAD	NTS
DATE	15.05.21	COPYRIGHT © 2013 BY DART AEROSPACE LTD	
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DART AEROSPACE LTD	Work Order:	164493
Description: Co-Pilot Collective Head (212)	Part Number:	D5155-3
Inspection Dwg: D5155 Rev: B		Page 1 of 2

INSPECTION SHEET

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
0.33	+/-0.030	0.329	✓		Mic	GA-03
0.06	+/-0.030	0.063	✓		D-6	GA-08
0.35	+/-0.030	0.350	✓		Mic	GA-03
4.700	+/-0.010	4.702	✓		H-6	31006
2.800	+0.010/-0.000	2.8015	✓		"	"
R0.19	+/-0.030	R0.188	✓		R-6	ref.
0.35	+/-0.030	0.351	✓		Mic	GA-03
2.547	+/-0.005	2.547	✓		Vern	GA-13
21°	+/-0.5°	21°	✓		Angle M.	CNC-17
Ø0.125 x 0.350	+0.004/-0.001 x +/-0.010	Ø0.127 x 0.353	✓		Vern/G-P	GA-13/REF.
R0.25	+/-0.030	R0.250	✓		R-6	ref.
1.850	+/-0.010	1.849	✓		H-6	31006
0.227	+/-0.010	0.2265	✓		"	"
Ø0.188 x 100°	+/-0.010 x +/-0.5°	Ø0.191 x 100°	✓		Vern	GA-13
Ø0.116	+0.004/-0.001	Ø0.118	✓		"	"
1.188	+/-0.005	1.1885	✓		H-6	31006
1.92	+/-0.030	1.920	✓		"	"
1.50	+/-0.030	1.500	✓		"	"
2.400	+/-0.005	2.400	✓		Vern	GA-13
0.300	+/-0.010	0.300	✓		"	"
R0.25	+/-0.030	R0.250	✓		R-6	ref.
Ø0.150	+0.005/-0.001	Ø0.153	✓		Vern	GA-13
3.000	+/-0.010	3.000	✓		"	"
R0.30	+/-0.030	R0.297	✓		R-6	ref.
R0.25	+/-0.030	R0.250	✓		"	"
1.350	+/-0.010	1.349	✓		H-6	31006
1.750	+/-0.010	1.754	✓		"	"
1.350	+/-0.010	1.349	✓		"	"
1.00	+/-0.030	1.002	✓			
R0.25	+/-0.030	R0.250	✓		R-6	ref.
10°	+/-0.5°	10°	✓		Angle M.	CNC-17
0.25	+/-0.030	0.250	✓		Mic	GA-03
R0.30	+/-0.030	R0.297	✓		R-6	ref.
2.500	+/-0.010	2.499	✓		H-6	31006
2.70	+/-0.030	2.699	✓		"	"
Ø0.150	+0.005/-0.001	Ø0.153	✓		Vern	GA-13
Ø0.627	+0.008/-0.001	Ø0.6275	✓		Mic/T-6	GA03/REF.
Ø1.187	+0.005/-0.000	Ø1.189	✓		Mic/T-6	GA02/REF.
Ø1.660	+/-0.010	Ø1.659	✓		Mic	GA-03

